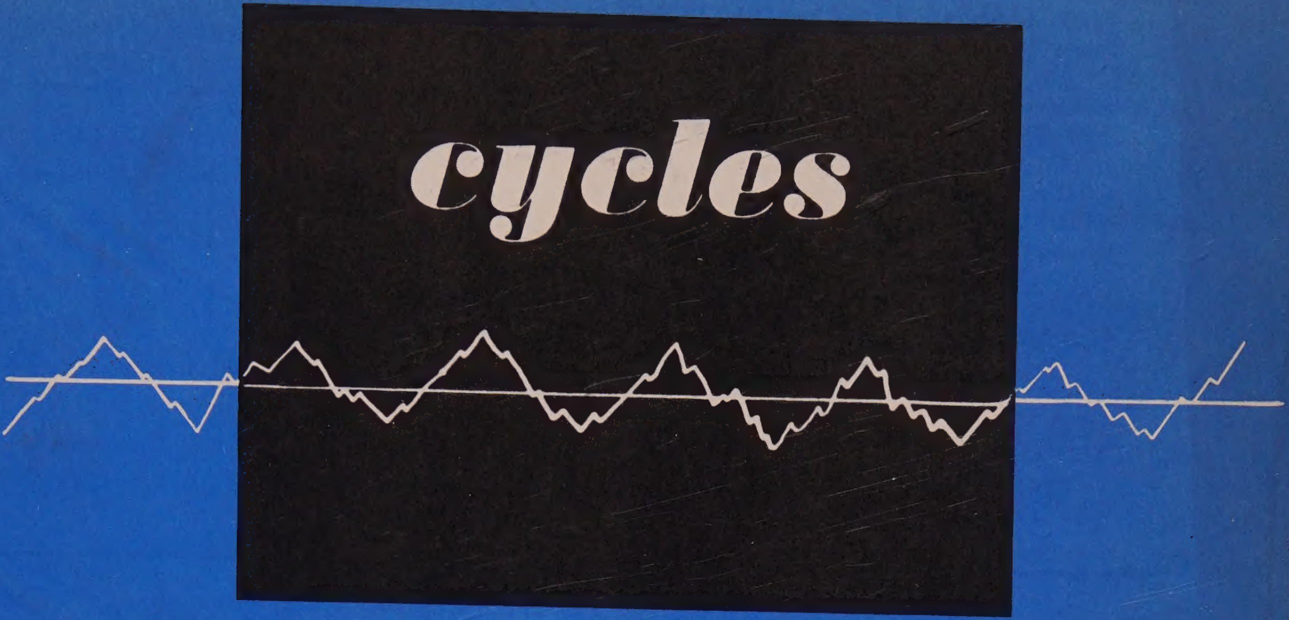
cycles



October 1957

FOUNDATION FOR THE STUDY OF CYCLES
New York, New York

CONTENTS

Page
DIRECTOR'S LETTER 251

RESEARCH

What's Ahead for Interest Rates? 253
Some New Cycle Work by G. T. Lane 257

TECHNICAL

The Techniques Involved in G. T. Lane's Cycle Work as Reported Upon pp. 257-62 263

FOUNDATION AFFAIRS

Report for 1956 266

LETTERS

The 12½, 37½ and 75-Hour Cycles of Human Reaction 268
GLOSSARY 272

MODIFIED GEISINGER INDICATOR OF INDUSTRIAL PRODUCTION

Forecast 273
Chart 274

THE FOUNDATION FOR THE STUDY OF CYCLES

The Foundation is a not-for-profit corporation, the board of directors of which consists the following committee

UNITED STATES OF AMERICA

Copley Amory, Chairman Emeritus

Charles Greeley Abbot
Secretary, Retired
Smithsonian Institution

Harold Elmer Anthony
Chairman and Curator
Department of Mammals
American Museum of Natural History

George Baekeland, Chairman of the Committee of the Foundation
The Bakelite Corporation

Harold Gardiner Bowen
Vice Admiral, U.S. Navy, Retired

Verne Burnett
Partner
Verne Burnett Associate

Hon. W. Cameron Forbes
Member, Board of Trustees
Carnegie Institution of Washington;
Life Member of the Corporation,
Massachusetts Institute of Technology

Webster N. Jones
Vice President, Retired
Carnegie Institute of Technology

Charles B. Lansing
Chairman of the Board of Trustees
Western Reserve University

Daniel Trembly MacDougal
Director, Retired
Department of Botanical Research and Laboratory of Plant Physiology,
Carnegie Institution of Washington

John Quincy Stewart
Professor of Astronomical Physics
Princeton University

CANADA

Hon. Charles Camsell
Commissioner, Retired
Northwest Territories

GREAT BRITAIN

Sir Patrick Ashley Cooper
Governor
Hudson's Bay Company

Julian Sorell Huxley
Former Director General
United Nations Educational, Scientific and Cultural Organizations

Edward R. Dewey, Director

Cycles is published by the Foundation for the Study of Cycles monthly at the Foundation's office at East Brady, Pennsylvania. Subscription rate $10.00 a year. Entered as second class matter at the post office at East Brady, Pennsylvania, with additional entry at Ann Arbor, Michigan. Publication office, 680 West End Avenue, New York 25, New York.

cycles

he official Bulletin of
e Foundation for the
Study of Cycles

VOLUME VIII NUMBER 10 OCTOBER 1957

THE DIRECTOR'S LETTER

Dear Member:

What's Ahead for Interest Rates?

I hope you like the article in this issue called "What's Ahead for Interest Rates?" It provides good background information regarding both interest rates and bond prices because, as you doubtless know, when interest rates go up, bond prices go down.

That article brings to mind a story told me some years ago by one of our members. It seems that about 1898 this man's father wrote to all the famous financiers of his day--J. P. Morgan, Schiff, and others of this stamp--to ask what interest rates were going to do. This man showed me their replies. All, without exception, said that interest rates had been going down for 25 years or so and that they would continue to do so. But of course all these men were wrong! Eighteen ninety-eight was just the time that, according to the 54-year cycle, interest rates were due to go *up*. Unfortunately the bankers of that day didn't know about this cycle. (Even today there are some who don't.)

What's Ahead for Residential Building Construction

The next article in the "What's Ahead" series will discuss what's ahead for residential building construction.

Residential building construction is dominated by one of our most interesting cycles--a cycle about 33 months long. This cycle is so well substantiated and so dependable that it throws a great deal of light on what's ahead.

This cycle has been traced back to 1784--which gives us over 60 repetitions. It was discovered in 1939 and has been coming true--except for war distortions--ever since. It dominates the behavior of many things, both in nature and in human affairs. Ignore it at your peril!

Rebirth

The next installment in the series of articles about the long term growth trends in the American economy will deal with some of the industries which have, in times past, experienced "rebirth." Long term growth trends of copper, lead, cigarettes, and petroleum production will be discussed and projected. The study of these industries will throw light on the question of whether--as many people believe--we are experiencing a rebirth of our entire economy at the present time.

The Postscript to *Cycles--The Science of Prediction*

Several issues have passed without an installment of the conversations with Robert Steele which I have been printing for you off and on for a year or two under the title "Postscript to *Cycles--The Science of Prediction.*" I have not discontinued these conversations, but I have allowed other things to crowd them out for a few issues for a variety of reasons.

The Reasons

First of all, I am not at all sure they interest you. Second, I am not sure you like the conversational style. And third, added to these misgivings, is the knowledge that I could do a much better job with this series of articles if I were a little further along with the cyclopedia of cycles about which I have often written.

I hope to learn your wishes in regard to this matter--and in regard to many other matters--at a New England meeting scheduled in Boston for October 8th, at a New York Area meeting scheduled in New York for October 10th, and at some mid-west meetings not yet scheduled.

Almost Everything in *Cycles* is a Postscript to the book *Cycles--The Science of Prediction*

I am not particularly disturbed by the fact that other material has crowded out the Robert Steele conversations because in a way almost everything in the magazine *Cycles* is a postscript to the book *Cycles--The Science of Prediction* written by E. F. Dakin and me several years ago. Take just the last issue and this issue as examples. "What's Ahead for Wheat Prices", in the last issue is merely a postscript to Chapter VII which dealt with the 9-year rhythm. That chapter told you of the 9-year cycle in wholesale prices, but failed to get further into detail. The article about Lane's work in this issue, also expands Chapter VII. In addition it tells you about a 6-year cycle not even mentioned in the book. Furthermore, Lane's work elaborates Chapter X, Causes, Correlations, and Conjectures.

The article called "Cycles in the Advance and Recession of Glaciers" expanded Chapter V, which dealt with cycles in natural phenomena.

The articles called "Some trends in the American Economy" which have appeared recently are part of a series of articles bringing up to date, clarifying, and expanding, Chapters I, II, III, and IV dealing with trends.

"What's Ahead for Interest Rates" in this issue expands into an article and brings up to date a mere mention in Chapter VI which discussed the 54-year rhythm in various phenomena. The article "The 54-year Cycle in Copper Prices" in the last report expands Chapter VI still further. And so it goes.

As almost every article is thus, in fact, a postscript, I have felt less pressure to put an installment of the Postscript in name in each issue.

Meetings of Members

I'll write up for a future report my remarks at the Boston and New York meeting referred to above.

In addition to meeting you personally, I hope, at the meetings, to learn whether you wish more or less explanation of techniques; whether or not you wish me to print the actual numerical values of the data; the course you wish the research to follow; the names of people who will undertake to manage future meetings; the names of people who wish to meet together for a discussion of techniques; and other matters of general interest.

Can't Understand

Here's the sort of thing I run into all the time: A man from the midwest writes, "As I work over some of the things you say in your...periodicals, and try to find the hows and the whys of your reasoning, I find myself stumped."

The answer is simple. I reason this way: Continued regularity cannot occur as a result of chance. Therefore, when we have a regularly recurring succession of ups and downs in *anything* which has repeated *so many times* that it cannot reasonably be the result of chance, we are justified in assuming a *cause* for the regularity. We may know what the cause is, as for example when we have a seasonal cycle. Or we may not, as for example when we have a 33-month cycle or a 22-year cycle. But in any event, *something* had to cause the regularity.

Whatever the cause, if it has occurred time after time for many repetitions, we can be confident that it is more likely to continue than not. As a practical matter therefore, it's wiser to take the rhythm into account than to ignore it (you *have* to do one or the other!).

That's all there is to it!!!

Cordially yours,

Edward R. Dewey

Edward R. Dewey
Director

WHAT'S AHEAD FOR INTEREST RATES?

INTEREST rates are due to go up for the next 20 years or so, if the 54-year cycle in interest rates continues to dominate the picture as it has for as far back (1790) as I have records.

The 54-year cycle in interest rates was first discovered over 30 years ago by N. D. Kondratieff, a Russian. He told about it in an article he wrote for *Archiv für Sozial wissenschaft und Sozialpolitik* in 1926 (Vol. 56, No. 3, pp. 574-609). *It has been coming true ever since discovery!*

Kondratieff's Chart

The upper curve in Fig. 1 on pages 254 and 255 is taken from Kondratieff's article. It represents interest rates in England from 1820 through 1918. Actually the curve is for English consols inverted, because when interest rates are high bonds are low, and vice versa. The curve represents percentage deviations from long term trend smoothed by a 5-year moving average. Note how the curve falls off from the 1820's to the 1840's, climbs until the 1870's, falls off until the 1900's, and rises until the 1920's in waves which are about 54 years from crest to crest or from trough to trough.

Kondratieff dated highs and lows of the long cycle in interest rates at 1790 (low) 1816 (high), 1844 (low), 1874 (high), 1897 (low), and 1921 (probable high). I have fitted a rigid perfectly regular 54-year cycle to these dates (shown by a broken zigzag line) and projected it into the future as of 1926. The next turning points of the zigzag are 1951 (low), 1978 (high), 2005 (low), 2032 (high), and so on.

American Interest Rates

The lower curve charts the same zigzag together with American interest rates, 1857--1956. The line from 1857 through 1926 charts the Macaulay index of yield, high grade railroad bonds. The line from 1919 charts Moody's Aa railroad bond yield averages. Both lines have been made heavy from 1925 forward to show how Kondratieff's cycle has come out since discovery. Note how this curve, like the English interest rate curve, declines from the 1850's to the 1900's, rises until the 1920's and then continues by declining until the 1950's and then starts up again. Note particularly that interest rates not only declined for about quarter of a century as forecast by Kondratieff but that *they turned up at just about the time indicated by Kondratieff's work of 1926!*

54-Year Cycle Traced Back to 1260

Three waves (seven turning points) are not very much to go on. However, the case for the 54-year cycle is fortified by the fact that other series of figures show this 54-year cycle over much longer periods of time. In wheat prices in England for example a 54-year cycle is clearly traceable back to 1260. (See Figs. 2 & 3). Fig. 2 shows actual prices; Fig. 3 shows percentages above and below trend. It is easier to see the 54-year cycle in the percentages (Fig. 3) because in the early years, when wheat was only a few cents a bushel, the 54-year cycle was very small, in actual cents. Note in Fig. 3 how, starting about 1276 we have a series of waves, each roughly 54-years long, right across the page. Wave, wave, wave, wave, wave, wave, wave, wave, wave, wave, wave, wave!

54-Year Cycle Present in Many Things

A cycle of about 54 years has also been observed (over varying periods of time) in the United States in the alternate thick-

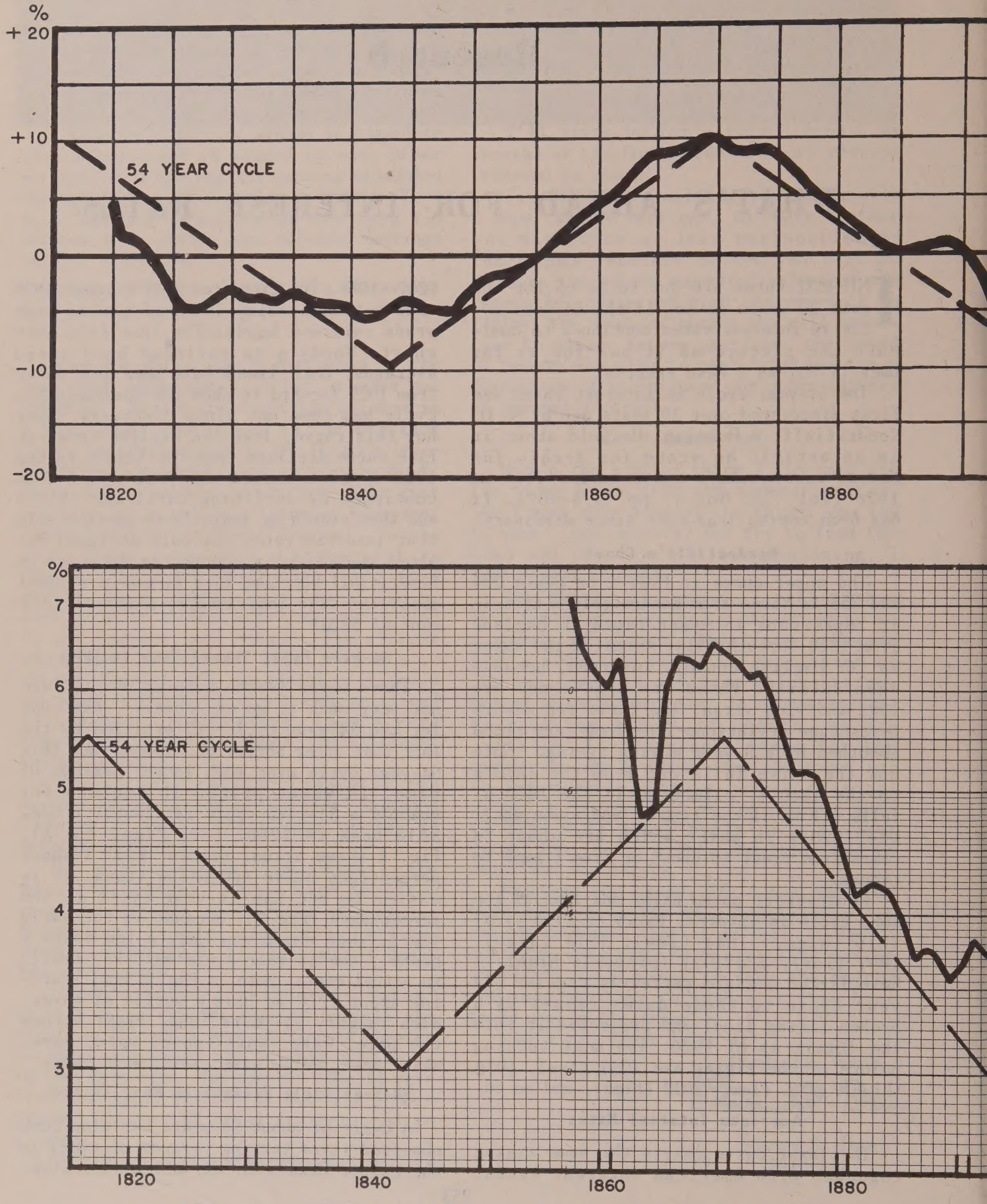
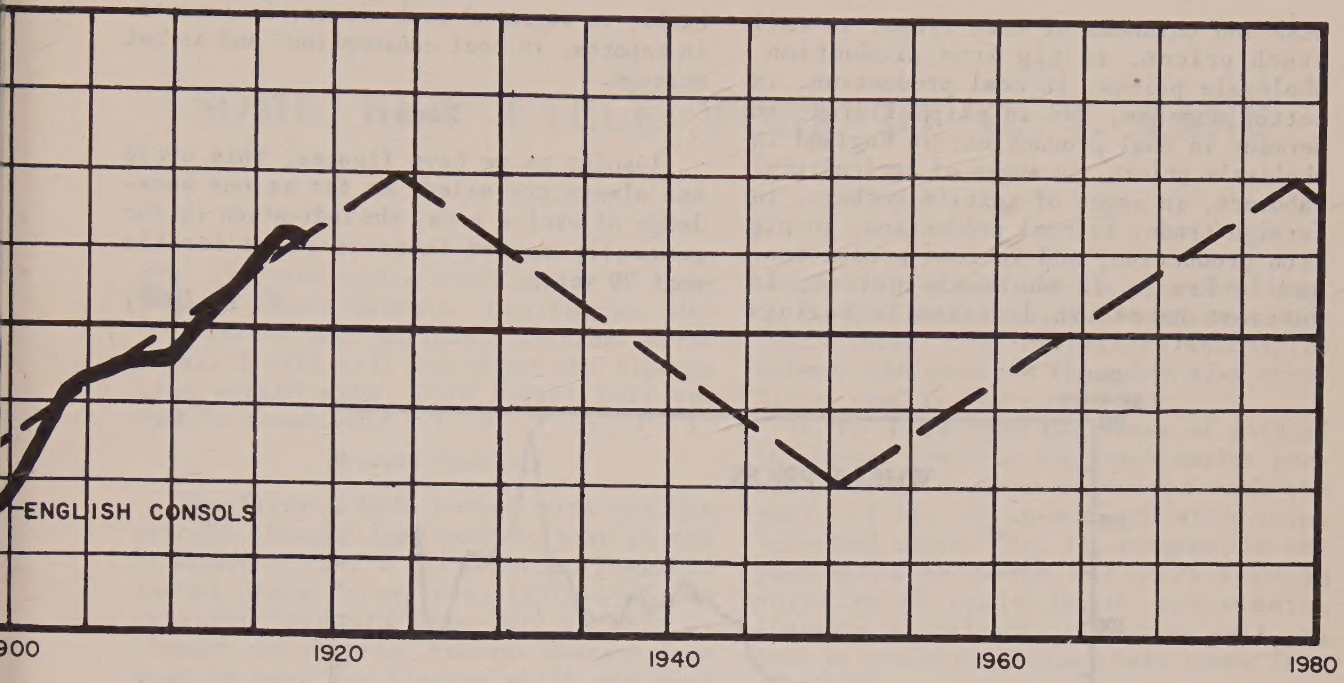
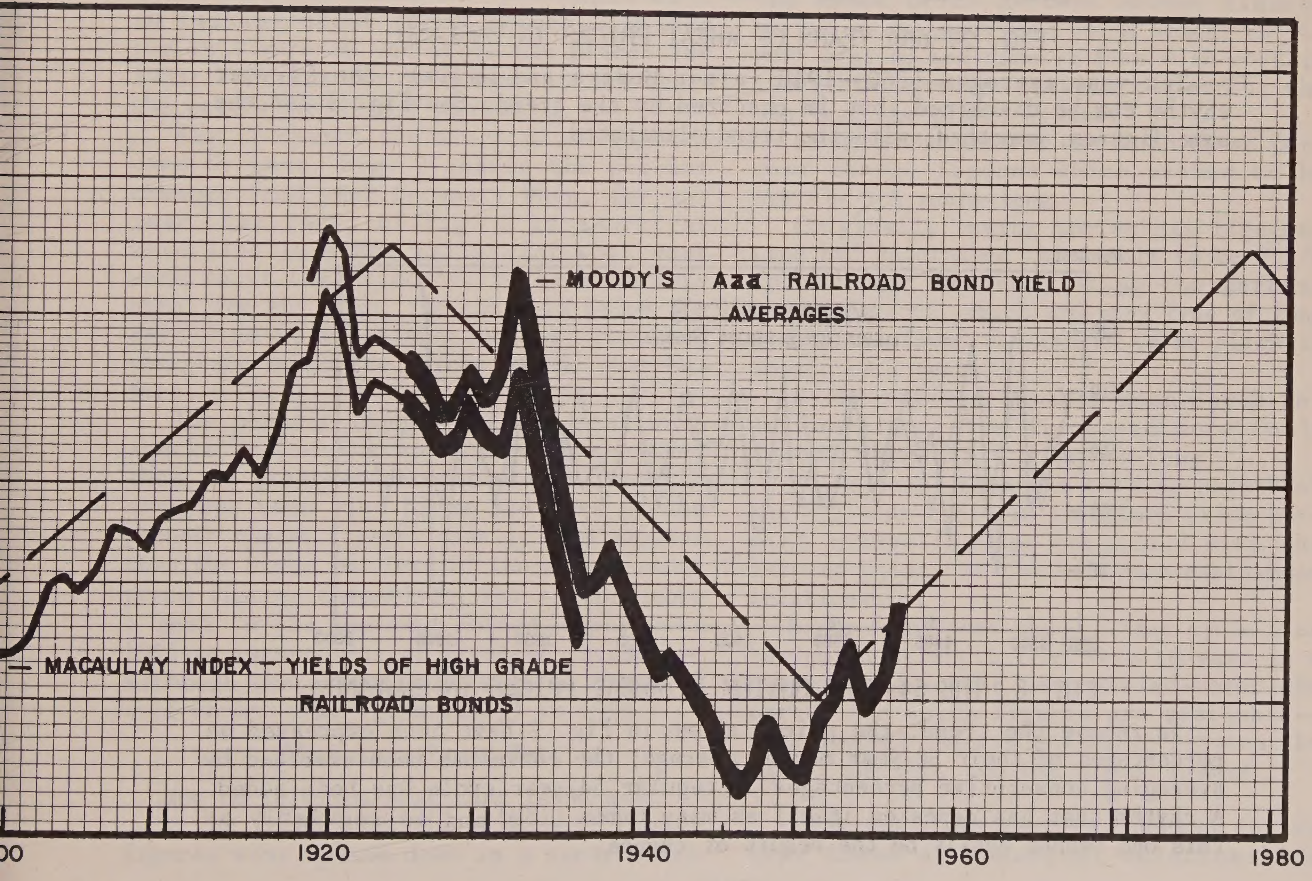


FIG. 1. THE 54-YEAR CYCLE IN INTEREST RATES.

The curves have been made heavy from 1925 forward to show how Kondratieff's forecast has worked out. Lower section, ratio scale.


ENGLISH CONSOLS
900
1920
1940
1960
1980


MOODY'S Aaa RAILROAD BOND YIELD AVERAGES
MACAULAY INDEX - YIELDS OF HIGH GRADE RAILROAD BONDS
00
1920
1940
1960
1980

ness and thinness of tree rings, in rail stock prices, in pig iron production, wholesale prices, in coal production, in cotton acreage, and in shipbuilding; in Germany in coal production; in England in wholesale prices, in wages of agricultural laborers, in wages of textile workers, in foreign trade, in coal production, in pig iron production, and in lead production; and in France in wholesale prices, in interest rates, in deposits in savings banks, in wages of coal miners, in imports, in exports, in coal consumption, and in oat acreage.

Summary

Insofar as we have figures, this cycle has always prevailed. As far as our knowledge of cycles goes the indication is for generally upward interest rates for the next 20 years.

E. R. Dewey

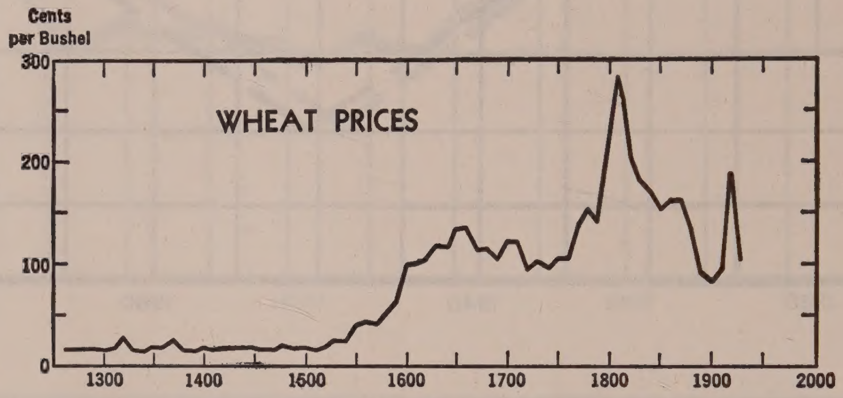


FIG. 2. 680 YEARS OF WHEAT PRICES IN ENGLAND

Ten-year averages 1260--1940 (after Rogers and Davis). The 54-year rhythm can be discerned, but is obscured by the trend. See Fig. 3 for the same figures, smoothed, with the trend eliminated.

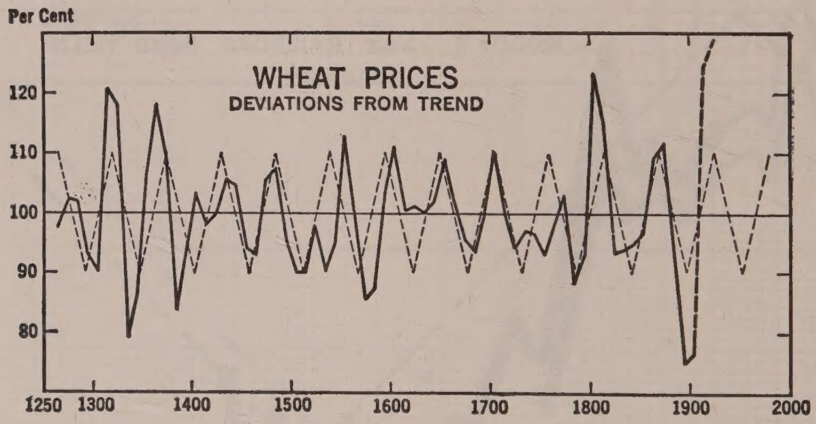


FIG. 3. THE 54-YEAR RHYTHM IN WHEAT PRICES IN ENGLAND

To remove the trend, the prices shown in Fig. 2 have been expressed as percentages of their 50-year moving average; the curve has been smoothed by averaging consecutive percentages. A regular 54-year cycle has been added. A rhythm that has repeated itself as many times (13½) and as regularly as this one cannot easily be the result of chance.

SOME NEW CYCLE WORK BY G. T. LANE

SOME new cycle work by G. T. Lane of Santa Barbara, California, deserves your serious attention. First of all I will tell you about the figures Lane worked with. Then I will tell you what he found out.

Percent Change

The figures Lane worked with are the percent changes from year to year of the Standard & Poor's Corporation Combined Annual Stock Price Index 1872—1956, as extended backward from 1872 to 1854 by Clement and Burgess. Percent changes from year to year are figures which are very familiar to you. You use such figures all the time. For example, you might say, in talking about stock prices, "Prices for 1954 were 19.94% above the prices for 1953;" "Prices for 1955 were 13.23% above the prices for 1954;" and so on.

Fig. 1 charts the stock price figures used by Lane. Fig. 2 charts the percent changes from year to year. When, for any year, the curve of Fig. 2 is above the zero line it means prices for that year were above the prices of the year before when, for any year, the curve is below the zero line it means that prices, for that year, are below the prices of the year before.

The percent change figures peak when stocks are moving up fastest—when they show the greatest percent change from the previous year. The highs and lows of the percent change figures usually come earlier than the highs and lows of the actual stock price figures themselves. For example note a peak in the percent change figures in 1955—a recent year of greatest increase—although the actual high year of the last bull market came (presumably) in 1956.

What Lane Found Out

Now to tell you what Lane found out.

1. He found that these percent change figures went up and down in a cycle which seemed to be almost exactly six years long.

2. He found (as I shall explain more fully later) that certain relationships between the moon and the earth also occur almost exactly every six years.

3. He found that the years of peak of the 6-year cycle in the stock market percent change figures coincided with the years of the earth-moon relationships mentioned above. That is, between the two phenomena he found not only seeming identity of cycle *length* but seeming identity of calendar *timing* as well, as best he could determine these times from annual figures.

4. He found that the six-year cycle in the stock price percent change figures varied in strength in a cycle which, on its part went up and down in time with certain interrelationships between the earth, the sun, and the planet Uranus.

5. He found another cycle in these percent change figures which seemed to be exactly 9.3 years long.

Originally, using the actual figures, Lane had determined this cycle to be 9 1/6 years long. However, using the percent change figures, which are very free of long cycles, he found the length to be slightly longer (9.3 years).

6. He noticed another moon-earth relationship (to be discussed more fully later) which is 9.3 years long.

7. He found that the turning points of the 9.3-year cycle in the stock price percent change figures coincided with the turning points of the 9.3-year earth-moon relationship.

8. He found that the 9.3-year cycle also varied in strength from wave to wave in a cycle which in the past varied—over the period for which figures are available—with another interrelationship between the earth, the sun, and the planet Uranus.

Lane would be the last person to say that these astronomical relationships

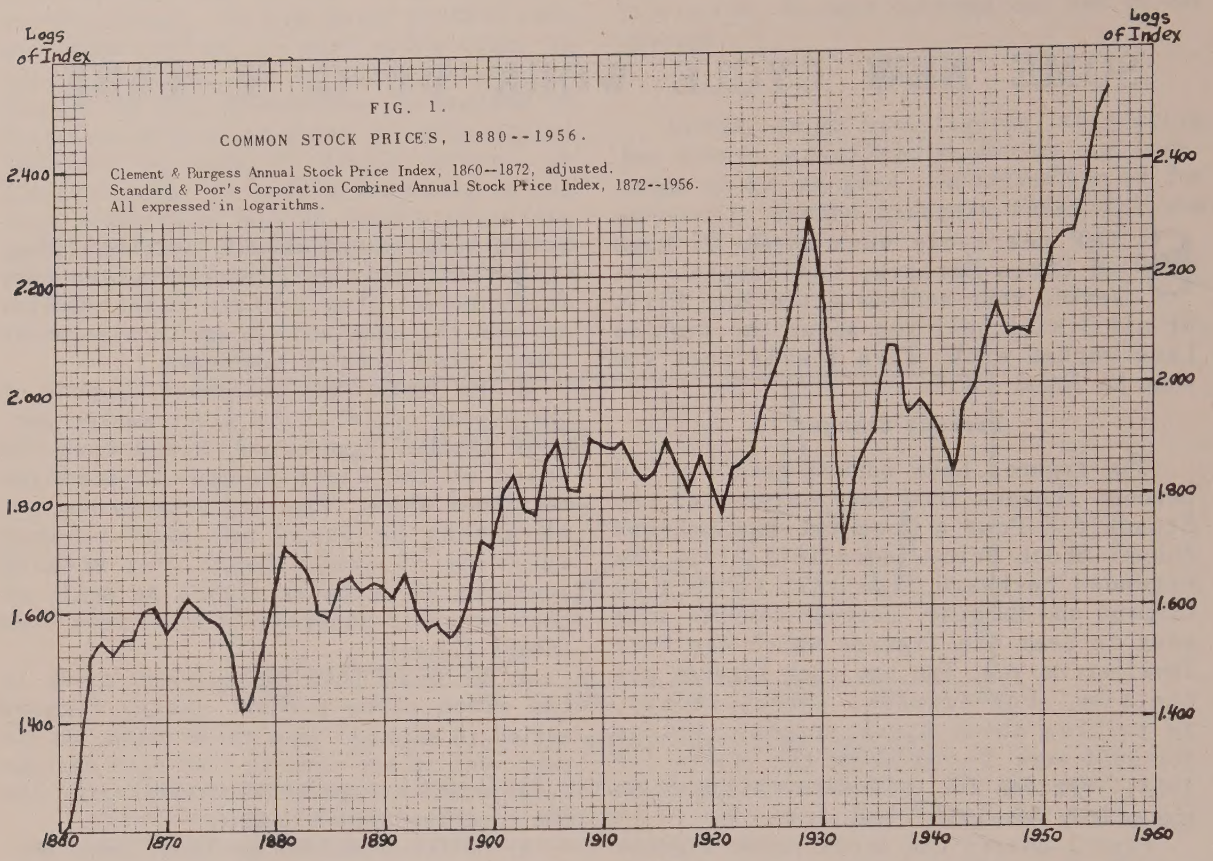


FIG. 1.

COMMON STOCK PRICES, 1880--1956.

Clement & Burgess Annual Stock Price Index, 1860--1872, adjusted.
Standard & Poor's Corporation Combined Annual Stock Price Index, 1872--1956.
All expressed in logarithms.

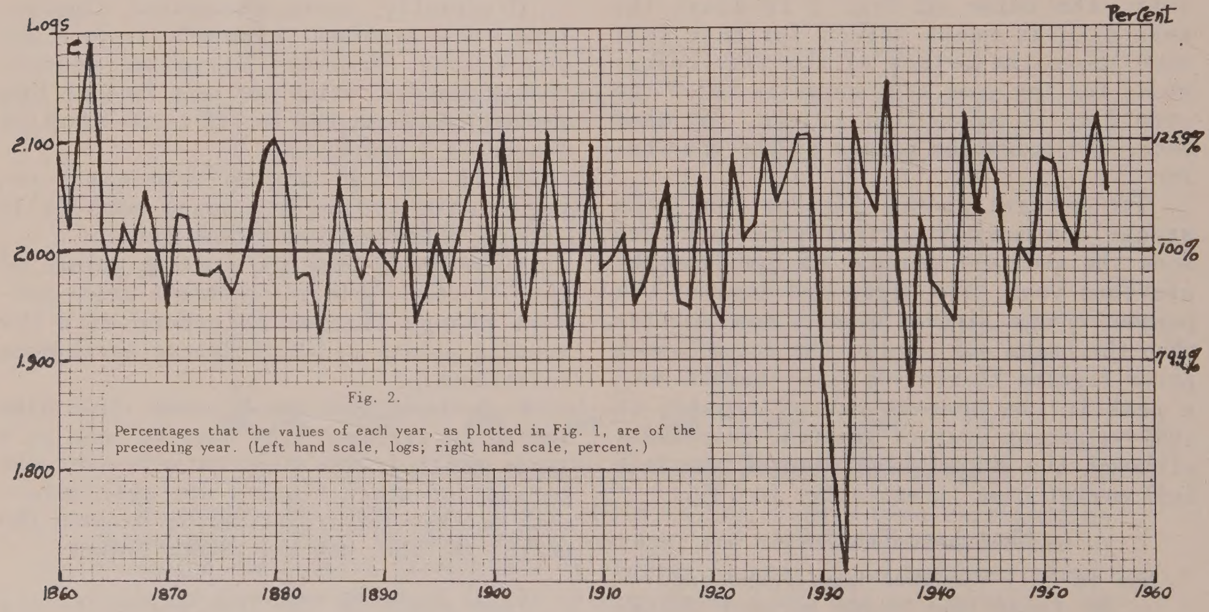


Fig. 2.

Percentages that the values of each year, as plotted in Fig. 1, are of the preceeding year. (Left hand scale, logs; right hand scale, percent.)

cause the terrestrial behavior, but if the correspondences prove to be more than coincidence, they may turn out to be very significant indeed, notwithstanding.

Filtering

Lane isolated his cycles by a process known as filtering. Filtering can be done so as to have little or no effect on regularly recurring cycles of the length in which the analyst is interested, but so as to minimize trend, cycles of other lengths, and randoms, Details of the processes used by Lane will be found in the Technical Section of this report. It is enough for the moment to say that filtering, like the construction of a moving average, loses values at each end of the series of figures with which you start.

The 6-Year Cycle

Fig. 3 shows you Lane's findings in regard to the 6-year cycle.

Curve B of Fig. 3, the middle curve, shows you the stock price percent change figures filtered in such a way as to minimize cycles which are longer or shorter than six years. As you can see, it shows a very regular 6-year cycle of varying amplitude. The cycle was strong in the 1870's, 1880's

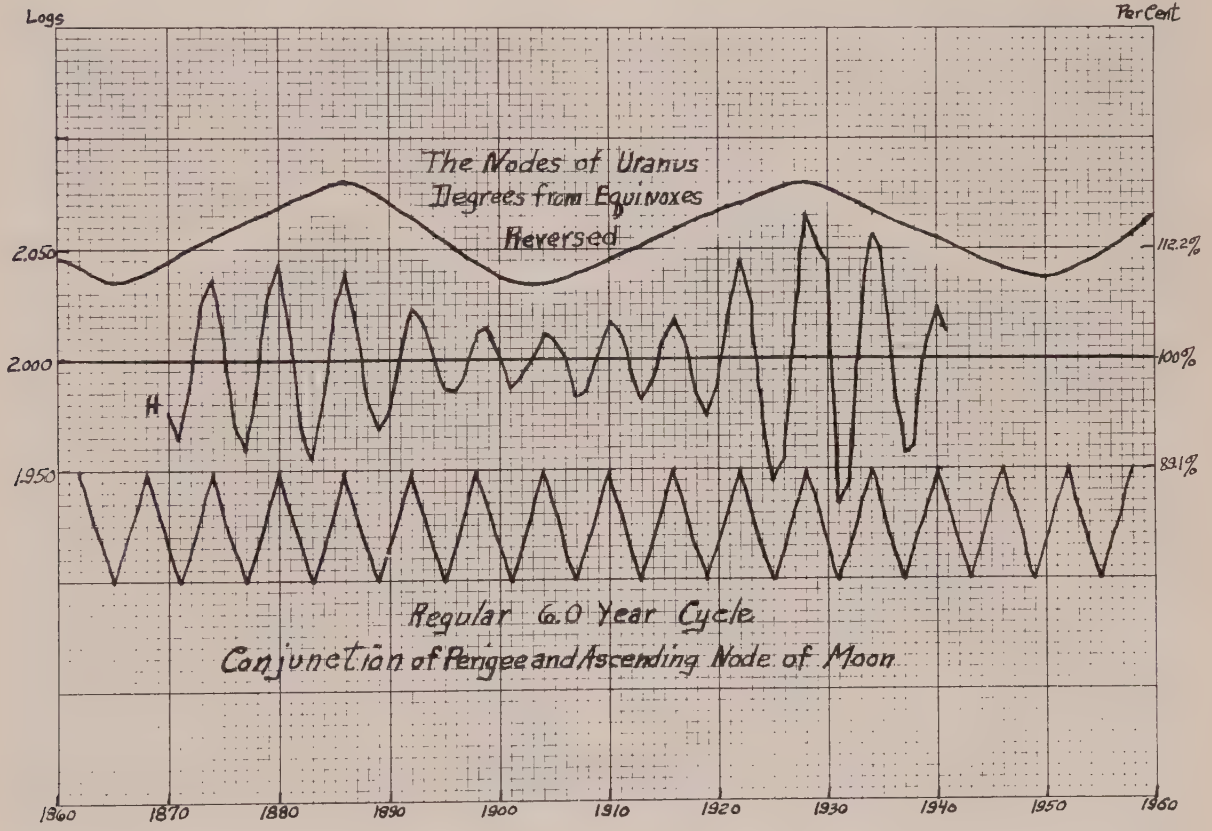


Fig. 3.

The 6-year cycle in the 1-year percent changes of Common Stock Prices (as charted in Fig. 2).

Curve A. Diagram to show the nodes of Uranus in degrees from equinoxes, reversed. (For explanation, see text.)

Curve B. The 1-year percent change figures filtered in such a way as to leave regular 6-year cycles unaffected, but to minimize randoms and cycles of other lengths. (For details see Technical Section of this report on pages 263-65.)

Curve C. Diagram showing the 6-year cycle created by the conjunction of the Perigee and the ascending node of the moon. (For explanation, see the text.)

and half into the 1890's. It was then weak through the rest of the 1890's, the 1900's, and half way through the 1910's. Then it was strong through the 1920's and 1930's, getting weak as we approach the 1940's. Until more time has elapsed you cannot see the filtered cycle past 1941.

Curve C of Fig. 3 diagrams the moon-earth relationship spoken of above.

Curve A of Fig. 3 diagrams the earth-sun-Uranus relationship which--over the period under review has fluctuated with the strength of the 6-year cycle. It was rising from 1865 to 1886, falling to 1903, rising to 1928, falling to 1950, and now rising again.

The 9.3-Year Cycle

Fig. 4 shows you Lane's findings in regard to the 9.3-year cycle. Curve B of this chart shows you the stock price percent change figures filtered in such a way as to minimize cycles which are longer or shorter than nine years.

Curve C diagrams the moon-earth relationship. Curve A diagrams the earth-sun-Uranus relationship.

Four Astronomical Phenomena

I have mentioned two astronomical phenomena observed by Lane which have wave lengths which seem to correspond to

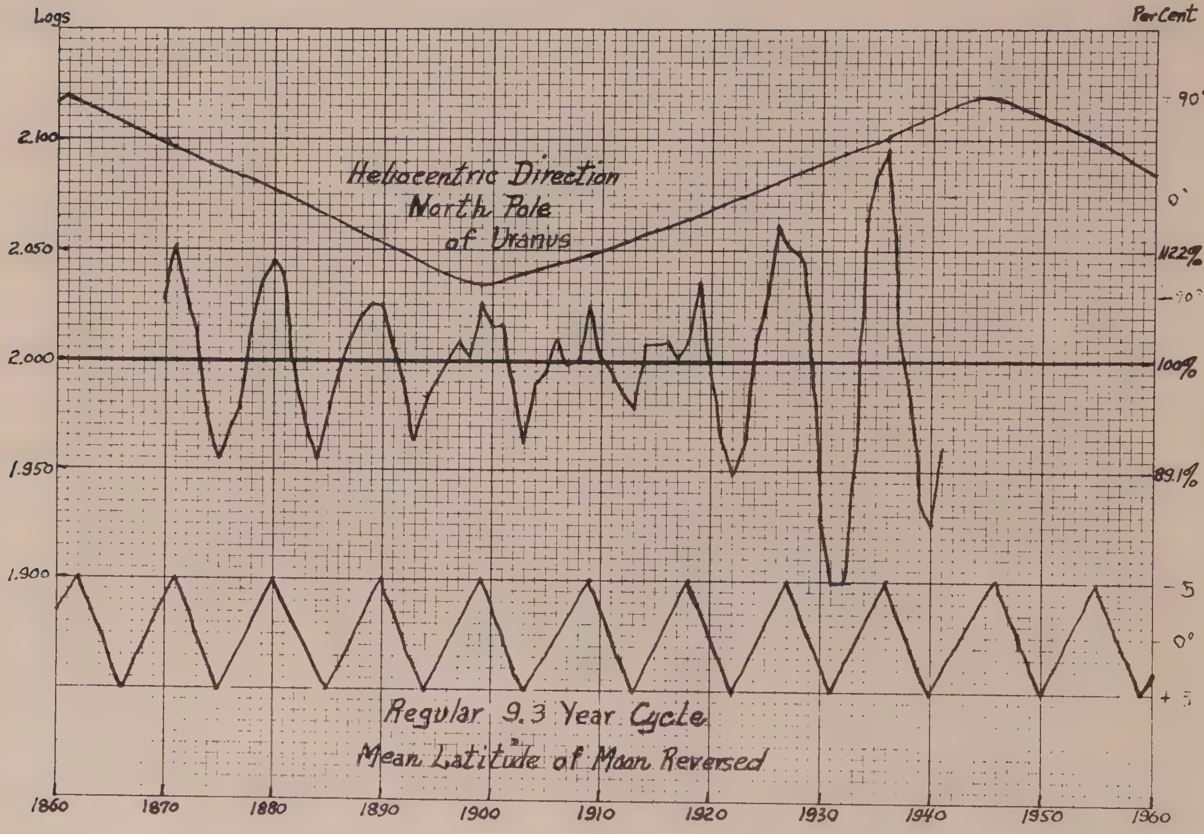


Fig. 4.

The 9.3-year cycle in the 1-year percent changes of Common Stock Prices (as charted in Fig. 2).

Curve A. Heliocentric direction of the North Pole of Uranus. (For explanation, see text.)

Curve B. The 1-year percent change figures filtered in such a way as to leave regular 9-year cycles unaffected, but to minimize randoms and cycles of other lengths. (For details see Technical Section of this report on pages 263-65.)

Curve C. Diagram showing the regular 9.3-year cycle created by the varying latitude of the moon, reversed. (For explanation, see text.)

the wave lengths of two different stock market cycles. I mentioned two other astronomical phenomena observed by Lane which correspond to the variations of strength of the two cycles. Let me now explain these astronomical phenomena more fully.

1. The Earth-Moon Relationship

First let me explain the earth-moon relationship which seems to coincide for wave length and calendar timing with the 6-year cycle in the stock market percent change figures.

Technically the earth-moon relationships are the conjunctions of the perigee of the moon's orbit with the ascending nodes of the moon's orbit on the ecliptic. This conjunction (coming together) occurs every 6 years (5.997 years, to be more exact).

The moon goes around the earth in an elipse. The point on the moon's orbit that is closest to the earth is called the perigee of the orbit. The direction of the perigee of the moon's orbit has a counter clockwise motion of $40^\circ.69$ year.

The plane of the moon's orbit differs somewhat from the plane of the earth's orbit. When the moon, following its orbit comes up through the plane of the earth's orbit, the event is called the moon's ascending node. When, half a rotation later, it goes down through the plane of the earth's orbit, the event is called the moon's descending node. The line connecting the nodes and common to both planes is called the line of nodes. The nodes and the line of nodes rotate clockwise at $19^\circ.34$ a year.

The perigee of the moon's orbit moves $40^\circ.69$ one way (counter clockwise) as the line of nodes moves $19^\circ.34$ the other way (clockwise). Thus the two phenomena, having been in conjunction (in line with each other and the earth), separate at the rate of $60^\circ.03$ $(40.69 + 19.34)$ a year for three years and then start moving toward each other again. Therefore, 5.997 years $\frac{(360^\circ)}{(60^\circ.03)}$ after the first conjunction, they are in line with each other and with the earth again. This event last occurred on September 21, 1952 and will occur again on September 21, 1958.

Halfway between these conjunctions there occur conjunctions of the perigee of the moon's orbit and the moon's *de*scending node. Between the conjunction of the perigee of the moon's orbit with the ascending node and the conjunction with the descending node, the six-year cycle in the percent change figures goes *down*; between the conjunction with the descending node and the conjunction with the ascending node, the six year cycle in the percent change figures goes *up*. This correspondence may of course be pure coincidence, but again, it may not.

2. The Earth-Sun-Uranus Relationship

Now let me tell you about the Earth-Sun-Uranus relationship which fluctuates in a way that seems to correspond to the *strength* of the six-year cycle. You will recall that the six-year cycle is first strong, then weak, in a cycle which, on its part, is about 42-years long. (See Fig. 3, Curve B.)

The curve above it shows how well the sun, the earth, and the planet Uranus are in line at the times of the conjunctions described above (the times of the perigee of the moon's orbit and the moon's ascending node). When the curve is high the three bodies are as nearly as possible *in* line (0° or 180°), when the curve is low the bodies are as nearly as possible *out* of line (90° or 270°).

3. The Varying Latitude of the Moon

Next I shall tell you of the earth-moon-relationship which varies in accord with the 9.3-year cycle of the percent change of the stock market.

The moon's orbit is in a plane which oscillates in relation to the plane of the earth's equator. As you know, the plane of the earth's equator is tilted 23½ degrees from the plane of the earth's orbit. The oscillation of the plane of the moon's orbit in relation to the plane of the earth's equator takes 9.3 years from the time the two planes coincide until they coincide again. The divergence is measured in mean latitude. The lower curve in Fig. 4 diagrams the course of the alternation, rising as the two planes approach each other, falling as they pull apart. At peak the two planes coincide and the mean latitude is zero; at trough the two planes are farthest apart and the mean latitude is at its maximum—about 5°.

4. The Longitude of the North Pole of Uranus

The fourth astronomical relationship which Lane found to vary with his percent change stock market figures, as far as they go, has to do with the direction of the north pole of the planet Uranus. Uranus is a large planet (its mass is 14.6 times that of the earth), it rotates very fast on its axis (once in 11 hours), and its poles are almost horizontal (98° from the vertical) in relation to the plane of its orbit, instead of nearly vertical (23½° from the vertical) as with us. Lane has given a neutral value (0°) to the times (for example 1924) when the north pole of Uranus is pointed neither toward the sun nor away from it. Over a 21-year period the north pole of Uranus moves toward the sun so that by 1945 it is pointed directly toward it (90°). Forty-two years later (or earlier) the north pole of Uranus will be pointed directly away from the sun (-90°). The stock market figures filtered to show the 9.3-year cycle extend only from 1870 to 1941. However, over this period of time the 9.3-year cycle does increase and decrease in strength in accordance with the direction of the *north* pole of Uranus.

Nothing Proved—Yet

Please don't get the idea that any relationship has been established between stock prices and astronomical events. The stock market cycles may not be exactly 6 and 9.3 years long, and even if they are, the 6- and 9.3-year lunar cycles may have nothing whatever to do with the matter. Plagues of mice come every four years; so do presidential elections, but there is no connection that I know of! Church bells ring every seven days and we have a special kind of Sunday bun for breakfast every seven days, too, but the bells don't cause the buns to rise, nor do the rising buns cause the bells to ring. This is true even though the rising of the buns and the ringing of the bells come on the same day—in fact almost at the same hour.

On the other hand correspondences are provocative, expecially in a field like cycles where we are groping for causes of cycles and the laws that make cycles sometimes strong, sometimes weak; sometimes early, sometimes late. We need more investigations and observations of the sort made by Lane.

E. R. Dewey

Technical

THE TECHNIQUES INVOLVED IN G. T. LANE'S CYCLE WORK AS REPORTED UPON ON PP. 257-62.

LANE'S methods can be best explained by reproducing a section of his tabulation sheet and describing each computation. See Table 1.

The stub gives the year; Col. A the value of the Index for that year; Col. B the logs of the values in Col. A.

Col. C shows the computation of the 1-year moving percentage. To get the values in Col. C for any year, you take the value in Col. B for that year and 2.000 added to it (to avoid negative logs and to keep results in percent instead of ratios. As 2.000 is the log of 100, adding 2.000 to the log is the same as multiplying by 100 or moving the decimal place over two places); then the value in Col. B for the preceeding year is subtracted from the total. For example, the first value in Col. C is obtained as follows:

$$1.297 + 2.000 - 1.344 = 1.953.$$

All the analysis from here on was done with these 1-year moving percentages.

The first step in the filtering process was to construct a weighted moving average of the values in Col. C. The weights used were -1, 0, 2, 0, -1. That is, to get the value in Col. D for any year, you take twice the value in Col. C for that year, add 2.000 to it to keep result in percentages, subtract the value in Col. C two years before and the value in Col. C two years after. For example, the first value in Col. C is obtained as follows:

$$(2 \times 1.940) + 2.000 - 1.953 - 1.939 = 1.988.$$

The second step in the filtering process was to construct a weighted moving average of the values in Col. D, using the weights -1, 0, 0, 2, 0, 0, -1. Thus, to get the values in Col. E for any year, you take twice the value in Col. D for that year, add 2.000 to it to keep the result in percentages, subtract the value in Col. D three years before and the value in Col. D three years after. Thus the first value in Col. E is obtained as follows:

$$(2 \times 2.145) + 2.000 - 1.988 - 2.383 = 1.919.$$

The third step is similar. It consists of a weighted moving average with the weights-1/36, 0, 0, 0, 2/36, 0, 0, 0, -1/36. To get the values in Col. F for any year you take two thirty-sixths of the value of Col. E for that year, add 2.000 to it to keep it in percentages, and subtract one thirty-sixth of the value in Col. E four years before and one thirty-sixth of the value in Col. E four years after. (In practice you would take twice the value for that year, add 72.000, subtract the values four years before and four years after and divide by 36. That is, you would get the first value in Col. F as follows:

$$\frac{(2 \times 1.896) + 72.000 - 1.919 - 2.436}{36} = 1.984.$$

These particular weights are needed so that the 6-year waves, if any, will have the correct amplitude.

The values in Col. F also contain .534 of the amplitude of any 9-year cycle. This is separated out by computing Col. G and subtracting Col. G from Col. F to get Col. H.

Col. G consists of a weighted moving average of Col. F with the weights -1/3, 0, 0, 0, 0, 0, 2/3, 0, 0, 0, 0, 0, -1/3. Thus, to get the values of Col. G for any year you take 2/3 of the corresponding value in Col. F. plus 2.000, as always, less 1/3 of the value in Col. F six years before and less 1/3 of the value in Col. F

TABLE 1.

A Section of Lane's Work Table Showing Actual Computations.

	A	B	C	D	E	F	G	H	I
	Index	Logs of A	2. + B − B₋₁ yearly Comparison	$2.+2C-C_{+2}-C_{-2}$	$2.+2D-D_{+3}-D_{-3}$	$\frac{72+2E-E_{+4}-E_{-4}}{36}$	$\frac{6+2F-F_{+6}-F_{-6}}{3}$	F+2−G 6yr cycle	$\frac{\text{ampl } G}{.534}$ 9 year cycle
1854	22.1	1.344							
1855	19.8	1.297	1.953						
1856	20.3	1.308	2.011						
1857	17.7	1.248	1.940	1.988					
1858	14.5	1.161	1.913	1.727					
1859	12.6	1.100	1.939	1.916					
1860	15.4	1.188	2.088	2.145	1.919				
1861	16.2	1.210	2.022	1.915	2.190				
1862	21.3	1.328	2.118	2.120	2.564				
1863	33.0	1.518	2.190	2.383	2.654				
1864	35.2	1.546	2.028	1.913	1.896	1.984			
1865	33.2	1.521	1.975	1.760	1.265	1.957			
1866	35.2	1.546	2.025	1.967	1.563	1.969			
1867	35.2	1.546	2.000	2.015	2.302	1.997			
1868	39.9	1.601	2.055	2.135	2.436	2.022			
1869	40.8	1.611	2.010	1.988	1.878	2.009			
1870	36.4	1.561	1.950	1.815	1.674	1.990	2.014	1.976	2.026
1871	39.2	1.593	2.032	2.074	2.046	1.992	2.028	1.964 x	2.052 •
1872	42.0	1.623	2.030	2.131	2.168	2.006	2.016	1.990	2.030
1873	40.1	1.603	1.980	1.941	2.156	2.033	2.007	2.026	2.013
1874	38.2	1.582	1.979	1.967	2.158	2.023	1.986	2.037 •	1.974
1875	37.1	1.569	1.987	2.106	2.079	1.987	1.976	2.011	1.955 x
1876	33.9	1.530	1.961	1.911	1.675	1.955	1.983	1.972	1.968
1877	26.2	1.418	1.888	1.702	1.242	1.943	1.985	1.958 x	1.972
1878	28.2	1.450	2.032	2.002	1.804	1.994	2.009	1.985	2.017
1879	34.4	1.537	2.087	2.206	2.577	2.048	2.019	2.029	2.036
1880	43.5	1.638	2.101	2.195	2.796	2.067	2.024	2.043 •	2.045 •
1881	52.3	1.718	2.080	2.094	2.379	2.038	2.021	2.017	2.039
1882	49.3	1.693	1.975	1.924	1.662	1.971	1.997	1.974	1.994
1883	47.0	1.672	1.979	1.892	1.352	1.940	1.985	1.955 x	1.972
1884	39.5	1.597	1.925	1.807	1.489	1.956	1.976	1.980	1.955 x
1885	38.3	1.583	1.986	1.980	2.153	2.007	1.986	2.021	1.974
1886	44.8	1.651	2.068	2.237	2.556	2.039	1.998	2.041 •	1.996
1887	46.1	1.664	2.013	2.031	2.278	2.027	2.006	2.021	2.011
1888	43.4	1.638	1.974	1.883	1.771	1.997	2.011	1.986	2.021
1889	44.4	1.647	2.009	2.026	1.690	1.983	2.014	1.969 x	2.026 •
1890	44.0	1.644	1.997	1.977	2.048	1.991	2.014	1.977	2.026
1891	42.0	1.623	1.979	2.015	2.233	2.009	2.004	2.005	2.008
1892	46.3	1.666	2.043	2.125	2.151	2.017	1.994	2.023 •	1.989
1893	39.8	1.600	1.934	1.875	1.850	1.999	1.981	2.018	1.964 x
1894	36.6	1.564	1.964	1.914	1.881	1.991	1.991	2.000	1.983
1895	37.8	1.578	2.014	2.073	1.871	1.983	1.996	1.987	1.992

six years after. The first value of Col. G is thus:

$$2.000 - \frac{(2 \times 1.990) - 1.984 - 1.955}{3} = 2.014.$$

To get the values in Col. H we merely subtract each value in Col. G from the corresponding value in Col. F plus 2.000. Thus the first value is;

$$1.990 + 2.000 - 2.014 = 1.976.$$

These values in Col. H are plotted as the middle curve in Fig. 3.

The filtering process described above has no effect upon the length or amplitude of any regular symmetrical 6-year cycle, but does minimize cycles of other lengths and randoms. Beginners should be warned that there is a tendency for this filtering to emphasize evanescent 6-year cycles, present at random, but such phantom cycles will not have a constant phase relationship.

To get the values for the 9-year cycle Lane proceeded as follows: First he divided the *amplitude* of the values in Col. G by .534 to restore the full amplitude. This gave him the values in Col. I. For example, to get the first value in Col. I he proceeded as follows:

$$2.014 - 2.000 = .014$$

$$\frac{.014}{.534} = .026$$

$$.026 + 2.000 = 2.026$$

and so on down the column. This gave him his values for the middle curve of Fig. 4.

Every moving average, weighted or otherwise, has an effect on every cycle present in the figures. The object of filtering is to minimize the cycles you are not interested in and to leave undisturbed the cycles in which you are interested.

The effects of the various manipulations upon cycles of various lengths are shown in Lane's amplitude table, reproduced as Table 2 below.

For a more complete description of moving averages and filtering refer to:

Dewey, Edward R., *Cycle Analysis: The Moving Average,* Foundation for the Study of Cycles, 1950.

------------------"*How to Make a Cycle Analysis,*" Foundation for the Study of Cycles, 1956.

------------------"The Yeatman-Lane Modified Moving Percentage and the Lane Weighted Section Moving Average," *Cycles,* Vol. 1. No. 1, June 1950, pp. 12-15.

Yeatman, W. C., "A Method for Separating Cycles and Its Use in Conjunction With Other Methods," *Journal of Cycle Research.* Vol. 4. No. 4, October 1955, pp. 86-119.

E. R. Dewey

TABLE 2.

Lane's Amplitude Table Showing Effects of Manipulations Upon Cycles of Various Length

Length of Cycle	$2C-C_{+2}-C_{-2}$	$2D-D_{+3}-D_{-3}$	$2E-E_{+4}-E_{-4}$ F_1	$\times E \times F_1$ F_2	$\frac{F_2}{36}$ F	$\frac{F-F_{+6}-F_{-6}}{3}$ G	$\times G$	$-G$ 6yr. H	$\overline{34}$ 9yr. I
1	.000	.000	.000	.000	.000	.000	.000	.000	.000
2	.000	4.000	.000	.000	.000	.000	.000	.000	.000
3	3.000	.000	3.000	.000	.000	.000	.000	.000	.000
4	4.000	2.000	.000	.000	.000	1.333	.000	.000	.000
5	3.618	3.618	1.382	18.090	.500	.461	.230	.270	.431
6	3.000	4.000	3.000	36.000	1.000	.000	.000	1.000	.000
7	2.446	3.798	3.798	35.283	.980	.251	.246	.734	.461
8	2.000	3.414	4.000	27.312	.759	.667	.506	.253	.948
9	1.652	3.000	3.880	19.230	.534	1.000	.534	.000	1.000
10	1.382	2.618	3.618	13.090	.364	1.206	.439	−.075	.822
12	1.000	2.000	3.000	6.000	.167	1.333	.223	−.056	.418
14	.754	1.554	2.446	2.866	.080	1.266	.101	−.021	.189
16	.586	1.234	2.000	1.446	.040	1.138	.046	−.006	.086
19	.418	1.000	1.652	.773	.021	1.000	.021	.000	.039
20	.381	.824	1.382	.434	.012	.873	.010	.002	.019
24	.268	.586	1.000	.157	.004	.667	.003	.001	.006
27	.214	.468	.806	.080	.002	.551	.001	.001	.002
30	.172	.382	.662	.043	.001	.461	.0005	.0005	.001

Foundation Affairs

REPORT FOR 1956

LACK of space and the need to publish other more important material is responsible for the delay in reporting to you about income and expense for 1956.

Our income was $68,493; our expense was $67,379; our net gain for the year was $1,114.

I served the Foundation without pay. I also left with the Foundation $175. charged for my time in connection with research done on a fee basis. This was not altruism on my part. I would gladly have taken pay, and I think I rate it, but there just wasn't anything to pay me with!

Servicing Members Cost $4.62 Each

On the average we had 4,986 members on our books during 1956. *Not* including research, it cost on the average $4.62 to service these members for the year. Servicing includes printing and mailing the reports, sending bills, keeping records, answering letters, etc. The research cost $0.64 per member for the year in addition.

If none of our members had died, moved without leaving a forwarding address, resigned, or been dropped for non payment of dues, we would have been sitting pretty! Unfortunately this was not the case. We therefore had to go out and beat the bushes for replacements.

In spite of all we could do the number of members fell off from 5,754 on December 31, 1955 to 5,596 on December 31, 1956 (However it's now up to over 7,000!)

Replacements Cost $11.68 Each

Our replacements cost us $11.68 apiece to put on the books. As they paid $10.00 each it means that for each person becoming a member in 1956 we lost $1.68 (plus the cost of servicing). This of course will be made up *if* that new member renews in 1957.

Loss $1.36 a Member

Considering the membership division as a whole, we lost $6,804. or about $1.36 a member.

Contributions Save the Day

Our research was paid for by $5,457 in voluntary contributions over and above dues. My undying thanks go to these contributors. As you can easily see, without their help we would have had to fold up. We still have $2,244. from 1956 earmarked for research in 1957.

Incidental Income

Incidental income consisted of sale of publications, $594, sale of names of former members $3,085, sale of special advance Geisinger Indicator service, $722. As costs of these items are included in membership service costs we should perhaps consider them as membership income. If we do, the loss per member reduces to $0.48 each.

In addition we made a profit of $593 on the *Journal of Cycle Research,* a profit of $929 on research on a fee basis done for others. We had a loss for the year on the correspondence course of $333.

In The Black After All

The net gains for the year were thus $1,114 as stated at the beginning.

Detailed figures are given on the page next following.

E. R. Dewey

FOUNDATION FOR THE STUDY OF CYCLES

Income and Expense, 1956

Membership		
Dues from old members	$21,786.62	
Dues from new (1956) members	32,998.00	
Total Dues	54,784.62	
Less cost of servicing members (printing, mailing, bills, records, correspondence)		
New York Office	17,287.06	
East Brady Office	5,545.03	
Travel	215.00	
Total Service Costs	23.047.09	
Less cost of getting new members	38,541.96	
Total Membership Costs (not including research)	$61,589.05	
Loss on Membership		*($6,804.43)*
Contributions		
Contributions received	5,457.25	
Research cost	3,212.82	
Surplus for further research		$2,244.43
Other Income		
Sale of publications		594.09
Sale of names of former members		3,085.51
Sale of special advance Geisinger Indicator service		722.25
(Cost of the three preceding items included in the cost of servicing members)		
Sale of Journals	1,127.62	
Less cost of Journals	534.20	
Profit on Journal		593.42
Research done for others	1,682.90	
Less clerk hire	753.70	
Profit on research done for others		929.20
Correspondence course	364.00	
Less Cost of service	697.24	
Loss on correspondence course		*(333.24)*
Miscellaneous income	675.65	
Miscellaneous expense	592.48	
Miscellaneous profit		83.17
Net Gain for the Year		$1,114.40

Letters

THE 12 1/2, 37 1/2 AND 75-HOUR CYCLES OF HUMAN REACTION

IN January of 1956 I published a letter from a former Vice Consul to Siam who told of some cycle knowledge imparted to him by one of the wise men of that country. The vice consul, Mr. Dwight H. Bulkley, now of Cincinnati, had verified this knowledge to his own satisfaction by means of over 1000 case histories obtained in this country.

The wise man had told Mr. Bulkley that all human beings are like pendulums, acting and reacting (maintaining a homeostatic balance) in accordance with a cosmic rhythm of energy which we see most simply in the ocean tides. But here's the peculiar thing: Primary nodes of reactions are at 36-37½ hours, and 72-75 hours. Given an incident of stress or conflict at time X one can predict what the person will *do* 36 hours later (or approximately 3 high tides), and so on, cycle after cycle. Not only predict what a person might do, or how he might *feel* (active verb), but from events like illnesses, accidents, etc., going *backwards* 36-37 hours and 72 hours, one can often see spread out the precise reasons why people do what they do.

This wise man's emphasis was upon human beings as masters of their destinies, self-determined, engineering their respective "fates" with precision, in accordance with deep "subconsious" desires, motivations, which have their origins in painful associations in infancy.

In response to several letters from members I recently wrote to Mr. Bulkley to ask if he had anything to add to what he wrote previously. In reply I received the following letter:

MR. BULKLEY'S LETTER

Dear Mr. Dewey:

Research on the possible 36-hour Emotional Cycle continues as time and circumstance permit. Aside from the routine use of this phenomena as an aid in my greater self-understanding, and as a help in inter-personal relations, the following items of study may be worth mentioning:

Three diaries were abstracted and analyzed for significant causal relationship between events spaced at approximately 36 hours and 72 hours, with much edification and some amusement. I selected probably the two most famous diaries - that of Samuel Pepys, written in the 1660's, and the more recently published London Journal of James Boswell, dating 1763. I also analyzed the dairy of my deceased father, which was available in considerable detail from 1911 to 1935.

James Boswell made strenuous efforts to acquire an officer's commission in the Guards, with failure after failure. He was pinning his last hopes on the influence of Lady Northumberland. About 11 a.m. Monday morning, April 11, 1763, this good lady crushed him with a final ignominious rejection. What Boswell did 36 hours later as subconsious psychological homeostasis, or to "balance the books", so to speak - I leave to the connoisseur. It's a whopper.

I cite this Boswell anecdote as merely typical of several thousand cases I have record of, in which there appears to be a very definite causal relationship between human interpersonal events, involving emotional conflict, spaced at 12½ hours, 36-37 hours, and approximately 72 hours, and so on.

You asked for some additional examples from my files. I have over 1000 examples already collected, but one can't just pick them at random because they don't all "tell well." Some require excessive background, a large percentage are sexual, and many others relate to the deep but subtle homosexual conflict existing in perfectly "normal" men and women, and of course many are simple and routine things like headaches.

However, it is easy to pick out a large number of quotable examples and I hope that the following list will serve your purposes.

Case 1. Symptoms: violent coughing, dry, hacking and almost continuous. Throat showed no soreness, nor redness. No temperature. No indication of cold. 37 1/2 hours previous; neighbor accused subject of stinginess at grocery. Subject very angry, but held it in. In abreacting anger during session, she remembered many times she had been accused of this same trait when she was small, particularly by an obstreperous brother.

Case 2. Symptoms: oxygen hunger, inability to take deep breath, feeling of exhaustion. Subject red-faced, obviously under considerable stress. 37 1/2 hours previous: a near crash with a truck on the highway: subject had been half-dozing at wheel, awoke with a shock and barely swerved his car in time. Remembered terror connected with previous auto crash which took place some years before.

Case 3. Symptoms: trembling all over, fear of fainting, weakness, throughout body, feeling of mental jitteriness. Appearance of acute anxiety attack. 37 1/2 hours previous: subject's small son had got into his father's costly tools, strewn them over back porch, then locked his mother out of the house. It took her a half hour to persuade the child to let her back in.

Case 4. Symptoms: pain in calf of leg which started while walking. Continued walking, instead of increasing the pain, decreased it. In a stooping position, pain turned on again, did not decrease with walking. 37 1/2 hours previous: intense disgust with situation at work, employer's indecisiveness, desire to be away from there.

Case 5. Symptoms: inability to swallow, feeling of a lump in the throat, fluttering heart, difficulty in breathing. 37 1/2 hours previous: quarrel with husband; subject held in anger. This quarrel enhanced by another, about 10 hours after the first one. Subject began chuckling in realizing her "inability to swallow the situation," and started to yawn.

Case 6. Symptoms: acute "spell" of strangling and choking. Some disorientation as to time and place. Subject an advanced case of cancer. 37 1/2 hours previous: violent outburst of anger against landlady which so weakened him at the time he had to return to bed.

Case 7. Man attends company picnic. Sunday afternoon. Feels "left out", not one of the gang, though he drinks much beer to loosen up. Approx. 13 hours later, wakes up with a silly ditty humming thru his mind which he can't shake off. A phrase from two different songs: Pass the good word (a beer ad).. and Let me in (from Open the Door, Richard). Approx. 36-37 hours after picnic, 3:30am Tuesday, he is wakened by his dog whining to be let into house. (Dog always sleeps outside at night), Comment: Does dog identify with master, and dramatize master's subconscious?

Case 8. Death to middle aged man by heart attack, in hospital. 37 1/2 hours prior: Rushed by ambulance from home to hospital with ashsmatic attack, under oxygen. During ride, crisis appeared to be over. Patient was alert, awake, talkative.

Case 9. Middleaged man and brother being transported in Ambulance to hospital. The former locked himself out of his trailer, and trying to get in, slipped, fell on his head, but broke his hip. 37 1/2 hours prior: When asked what happened at (37 1/2 hours before accident).. both froze into silence. Uninjured brother observed to become faint, and seek chair and sit down.

Case 10. Wife driving, husband sitting alongside, pulled out from curb, making U-turn, ran headlong into passing truck. Neither injured, but car smashed, 36 1/2 hours prior: Close friend died at hospital. Subject and wife, were managing affairs of deceased.

Case 11. Female, single, middle aged, has sudden "side ache", on left side. 37 hours 50 min prior: Subject alone in hotel room just after midnight, overheard drunk in next room saying, "come on, let's go kill the SOB," and drags his companion down the hall.

Case 12. Young male returns to apartment after routine breakfast in restaurant, feels "queezy" in stomach, has diarrhoea. 35 1/2 hours prior: Arrived at party, greeted girl-friend with affectionate embrace, only to be pushed off coldly, without explanation. Emotions of anxiety-jealousy, fear of rejection.

Many of these cases, analyzed in this fashion, strip the social facade from a human personality, and lay bare the inner structure of the subconsious being with all of its hidden conflicts and motivations. This last sentence may sound rather frightening to anyone contemplating the use of this analytical method towards greater self-insight. So I hasten to add that there is what might be called a built-in safety factor, which is simply this: we "see" and accept only as much new insight as we are able to "handle" psychologically. What is too disturbing, too shocking, or too painful, we are gracefully blind to.

For instance, if I were to confront James Boswell on Wednesday, April 13th, 1763 and say, Ha! You know why you did what you did last night? Well, remember what happened Monday forenoon with Lady Hamilton? -- he might very well say Bah!, turn on his heels down the Strand and never give it another thought! Or, on the other hand, if the suggestion that the second event was the direct outcome of the first, and causually related, was not particularly disturbing to his beliefs about himself, he might then unleash with a flood of additional details and end up laughing uproariously.

This is what I mean by the built-in safety factor...

Now, readers of the two previous articles will recall the thesis that this rhythmic, cyclic analysis of human activities seems to indicate that there are no "accidents", i.e., that we do precisely what we do to ourselves - for reasons. We hurt ourselves, we injure ourselves, we hurt others, we damage properties - in many ways which appear to be "accidental", but which are precisely engineered, calculated, just as we wish.

But if you ask: why would anybody wish to seriously damage his own body and cause himself terrible pain? We can best answer by a typical real example.

I'm working quite peacefully at my desk. I get up to go to another office, and, emerging from my door into the hall I meet up with a janitor with a box on a push-cart. My right knee crashes into the corner of the box. Excruciating agony. So-called "accident". But wait a minute. Hmmm This I wanted? This pain? Just so much?, and now 11am Monday. So I check back 36 hours. . . Saturday evening. .about 10:30pm Ugh! Ran into the boss and got hell for some work I hadn't done.

Now what? Anger-rejection from boss... and then knee-pain. Related, goes way back. I'm about 2 1/2 years old. Dark night, terrible fall, stunned, big pain in right knee, terrified, alone. Then voices, and comes Father-the-Protector, father who loves or rejects, father who spanks or treats. And his tremendous arms lift me up and enfold me in Love-Acceptance-Security.

We associate things. Deep within me is that association, the great pain in my knee and the great wonderful feeling of his emotions towards me. We also project. My subconscious, infantile mind projects "father" onto the boss. He threatens rejection. I produce knee-pain. Ha! Now everything's OK. Or so people do, it seems.

Now, back another 36 hours from Saturday evening. Friday 10am. Some reason why I should want the Boss-Father to give me hell? Apparently. Another long story with ramifications having to do with a theme I might call Fear-of-Success. Riding a little high, desired to be slapped down.

And on back. Bing and then bong. Bing and then bong. Like a cosmic pendulum. with vast awareness and great precision. But consciously so blind. Various themes, patterns, associations, motivations, identifications woven into what is called a "personality".

I wish I could limit this discussion to just the objective analysis of a possible cycle or rhythm. I would guess that a majority of the readers of CYCLES have motivations to profit economically, to enrich themselves by speculative investments.

But even the economist probably has a lingering question as to more ultimate causes, or physical referrents, even though his main demand may be information of useful nature only.

In this letter, and in the two previous ones, I have discussed as far as I could the essential nature, or raw mechanics of this rhythm, with some suggestions as to physical referrents such as tides. Then, I have dealt, maybe too much, with its application. And this has necessarily been data of subjective sort. Psychology and psychotherapy.

Now, with your approval, I would like to round out the subject, and place this analytical tool in the context of a broad, general philosphy.

Down thru the ages there have been a number of mystics, sages, saints and enlighted philosophers who have formulated methods of achieving what has variously been called "salvation", "Self-Realization", "Enlightment", "Heaven", "Perfect Peace", etc.etc., It's been put in many ways, in the context of many cultures, and on the surface they have appeared to differ with each other in apparently fundamental aspects. Socrates said "Know Thyself". And Plato said "Self-conquest is the greatest of victories." The Buddha, The Christ, Lao Tze, Moses, Mohammed, Ramakrishna, St. Augustine and dozens of others formulated and taught methods of Achieving - whatever we wish to call it. In Yoga there are several schools incorporating a variety of approaches and useful exercizes.. and so forth.

I have found it quite satisfactory to interpret all of these formulations as methods of "de-conditioning", and this great Goal as the Unconditioned State of being.

The normal, social human being is from infancy "conditioned", and under overwhelming social pressures, involving pain; "forced", in a sense to be like everyone else. To act and react in appropriate (and very limited manner. Actually it is an agreement. A confluence. To be "human".

To un-do this process, to unwind, to "de-condition" and free oneself from this extremely limited social structure with all of its threats of rejection, etc., is not easy. There are, however, these various formulations of method by which it can be accomplished - with effort, determination, courage, and time.

Underlying all of these systems are a number of basic principles: self-honesty, full recall of the past, acceptance of self responsibility for events and emotional relations with others, the extension of internal body awareness, acceptance of external realities, relaxation of body tension, and the extension of subjective symmetry. These are all things which a person must DO, by himself, to himself, to liberate himeslf. These are all involved in the mechanics of de-conditioning.

I consider this 12-36-72hr analytical method only as a precision tool to be used in the adventure of self-discovery, and consistent and compatible with any or all of the formulations of method noted above. Because it is only a tool, it should be used in conjunction with one of the total formulated methods. By itself, it may be too drastic, too severe, despite the "built-in safety factor" described above. Together with one of the great methods, it can promote much more rapid progress towards that ultimate Achievement, the Unconditioned State, in which the tremendous capacities and functions of the human body-mind are free.

Sincerely,
Dwight H. Bulkley

4210 Walton Creek Road
Cincinnati 27, Ohio

Wants to Exchange Work Sheets

Mr. Richard A. Hanan, Penthouse - Mills Building, San Francisco 4, California would like to exchange work sheets with students of 5- to 25-week cycles in Dow Jones Industrials, cash corn, and individual stocks. If interested, write him direct.

GLOSSARY

Cycle, coming from a Greek word meaning circle, implies coming around to the place of beginning. Strictly speaking, in the word itself there is no necessary implication of regularity, but the word is often used loosely to denote rhythm or periodicity.

When the word cycle is modified by a time interval such as 6-year cycle, 20-month cycle, 17-day cycle, the phrase usually means a cycle that recurs with reasonable regularity. In other words, it denotes rhythm.

Rhythm, coming from a Greek word meaning measured time, implies a beat, or a tendency toward perfect regularity or periodicity. It is what we really mean on most of the occasions when we use the word cycle.

Cycle analysis, as we are using the term in this bulletin, should really be called rhythm analysis, as we are concerned with **rhythmic cycles**—cycles that recur with a beat.

Periodicity, in the strict sense, is the quality of being regularly recurrent. It is a quality not often found in nature. The ideal cycles which are often added to a chart to diagram a rhythmic cycle are true periodicities.

A **wave** is one single cycle or undulation. Waves have **frequency**, **amplitude**, **period**, and, at least when they represent harmonic curves, **phase**.

Frequency is the number of complete vibrations to and fro--i.e. waves--per second It is a term not used by cycle analysts when dealing with cycles that are over a second in length.

Amplitude is the extent of a vibratory movement measured from the average position to an extreme position; that is, it is the height or depth of the wave above or below the axis around which the wave oscillates.

Positive amplitude is the distance above the axis, **negative amplitude** is the distance below the axis, **overall amplitude** is the sum of the positive and negative amplitudes. Amplitudes may be expressed in absolute units or as a percentage of the value of the axis.

Period is the interval of time required for a periodic motion to complete a cycle and begin to repeat itself. It is the length of the wave from crest to crest or trough to trough or from some other point on the curve taken as the **epoch**. The **epoch** is the point on the curve chosen as the beginning of the wave. In physics and astronomy it is usually taken as the point where the curve crosses the axis on its upward motion, but it may be any other point as well.

Phase, in a simple harmonic curve, is the point or stage in the period to which the oscillation has advanced considered in relation to a standard position or assumed instant of starting. It is measured along the axis, usually in degrees. By extension of meaning, **positive phase** is therefore the part of the wave above the axis or trend, and **negative phase** is the part of the wave below the axis or trend. When the crests (or troughs) of two or more different series of waves come at the same time, the waves are said to be **in phase** with each other. When the crests of one series of waves coincide with the troughs of another series, the series are spoken of as in **reverse phase**.

A **simple harmonic curve** referred to once or twice above, is the curve you would get by tracing the motion of a pendulum upon a piece of smoked paper that was moving at uniform speed at right angles to the direction in which the pendulum was swaying back and forth. It is perfectly simple, regular, and symmetrical and, in mathematical study, is usually referred to as a **sine curve**. A single oscillation is called a **sine wave**.

A **rectilinear** or **saw-tooth wave**, on the other hand, is a wave the sides of which are straight lines; in other words, zigzag.

Trend is the tendency of data in a series to increase or decrease during a long period of time. The expression, "a long period of time," cannot be defined except relatively. If you are dealing with hourly figures, you might consider trend as the general direction over the past 30 or 40 hours. With yearly figures "trend" might mean the general tendency over the past 100 years or more.

An **average** is a typical value which tends to sum up or describe a number of figures. There are at least five different kinds of averages commonly used by statisticians; but the one which ordinary folk think about when they hear the word **average** is the one computed by adding all the items together and dividing the total by the number of items. Thus, if we have four items, 10, 12, 11, and 13, the average of these items is 10 + 12 + 11 + 13 (46) divided by 4, or 11½. An average of this sort is more accurately called the **arithmetic mean**.

An arrangement of numbers is called a **series**.

When the numbers with which we deal represent events which occur one after another in time, the arrangement is called a **time series**. Thus, in the example above, if 10, 12, 11, and 13 represent the price of cotton for each of four consecutive years, or represent the number of accidents on each of four consecutive days, you would call the numbers by this name--a time series.

You could still average the numbers and say, for example, that the average price for all four years was 11½ cents, or that during the period there was an average of 11½ accidents per day, as the case might be.

You could also say that the average price for the first three years was 11 cents, (10 + 12 + 11 (33) divided by 3) and that the average price for the last three years was 12 cents (22 + 11 + 13 (36) divided by 3).

A **moving average** is a succession of averages secured from a series of numbers by dropping the first number (item) in each group averaged and including the next number in the series after the group, thus obtaining the next group to be averaged, and so on.

Thus, when you averaged the first three numbers of our time series (10, 12, and 11) and got 11, and then dropped the first number (10) and added the fourth number (13) and averaged again and got 12, you were constructing a moving average

Because you were averaging three items at a time, you would call the result a 3-item or 3-term moving average. If the items represented yearly values you would call the result a 3-year moving average. If the items represented daily values, you would call the result a 3-day moving average.

The **moving total** is the series of successive totals from which the moving average is computed. For example: When , above, you added 10, 12, and 11 to get 33, and then added 12, 11, and 13 to get 36 (as a step in the task of getting 11 and 12, the two terms of the moving average), you were computing a moving total.

THE MODIFIED GEISINGER INDICATOR

THE Modified Geisinger Indicator is a series of numbers which, in the past, have gone up and down ahead of corresponding movements of the Federal Reserve Board Index of Industrial Production. Thd Modified Geisinger Indicator thus throws some light on the probabilities of the future.

The F. R. B. Index of Industrial Production measures physical production in the U. S. A. It is a weighted average of tons, yards, gallons, and numbers of things produced each month.

The Modified Geisinger Indicator is the sum of two Indicators, the Geisinger Indicator and a First Difference Indicator.

The Geisinger Indicator was invented by Robert Geisinger. It is derived from figures which are published each month in the *Survey of Current Business*. It is charted for you as Curve A on pages 114 and 115.

Curve B on these same two pages charts the First Difference Indicator, which is merely the amount by which the smoothed F. R. B. Index is above or below the value for the preceding month. The smoothing is effected by means of a centered 3-month moving average and a 2-month moving average posted to the second position.

Curve C charts the sum of the values of Curves A and B. This curve is called the Modified Geisinger Indicator. It suggests in a general way what the F. R. B. Index may do some eight months later.

Curve D charts the values of the F. R. B Index of Industrial Production.

Curve E re-charts curve C, advancing it by 8 months. This advance is for two reasons (1) so that you can more easily compare the past behavior of the Modified Geisinger Indicator with the behavior of the F. R. B. Index, and (2) so that you can have a better idea of what the F. R. B. Index may do in the future.

FORECAST

AS expected, the sideways motion continued. Industrial production for August (seasonally adjusted, as always) continued at 144.

The Geisinger Indicator for May 1957 (January 1958 when projected) was -0.6, about the same as for April. Its value for June 1957 (February 1958 when projected) will lie between -1.2 and -2.2.

Values for the First Difference Indicator and the Modified Geisinger Indicator are given below.

A sideways motion continues to be incated.

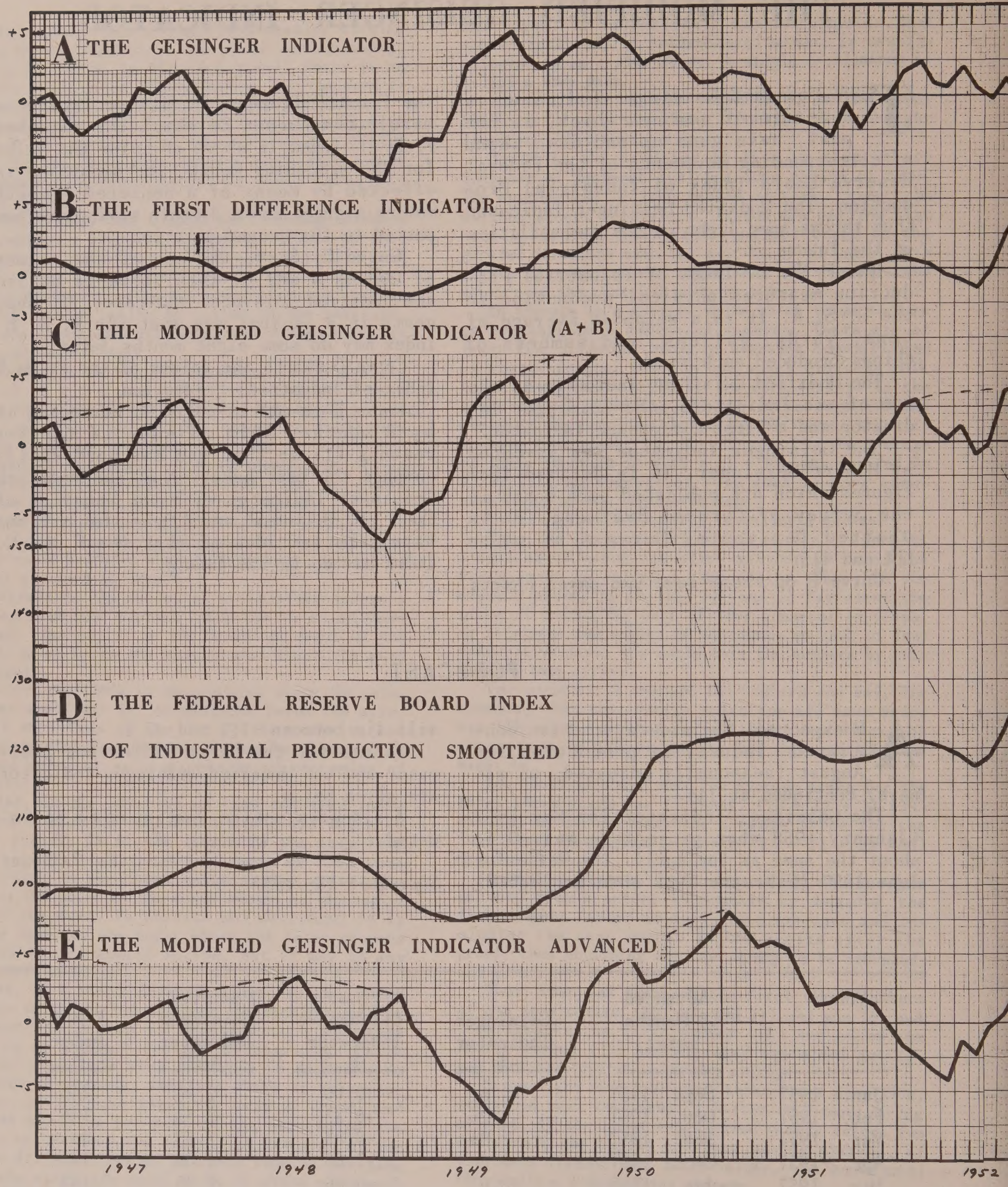
E. R. Dewey

September 26, 1957

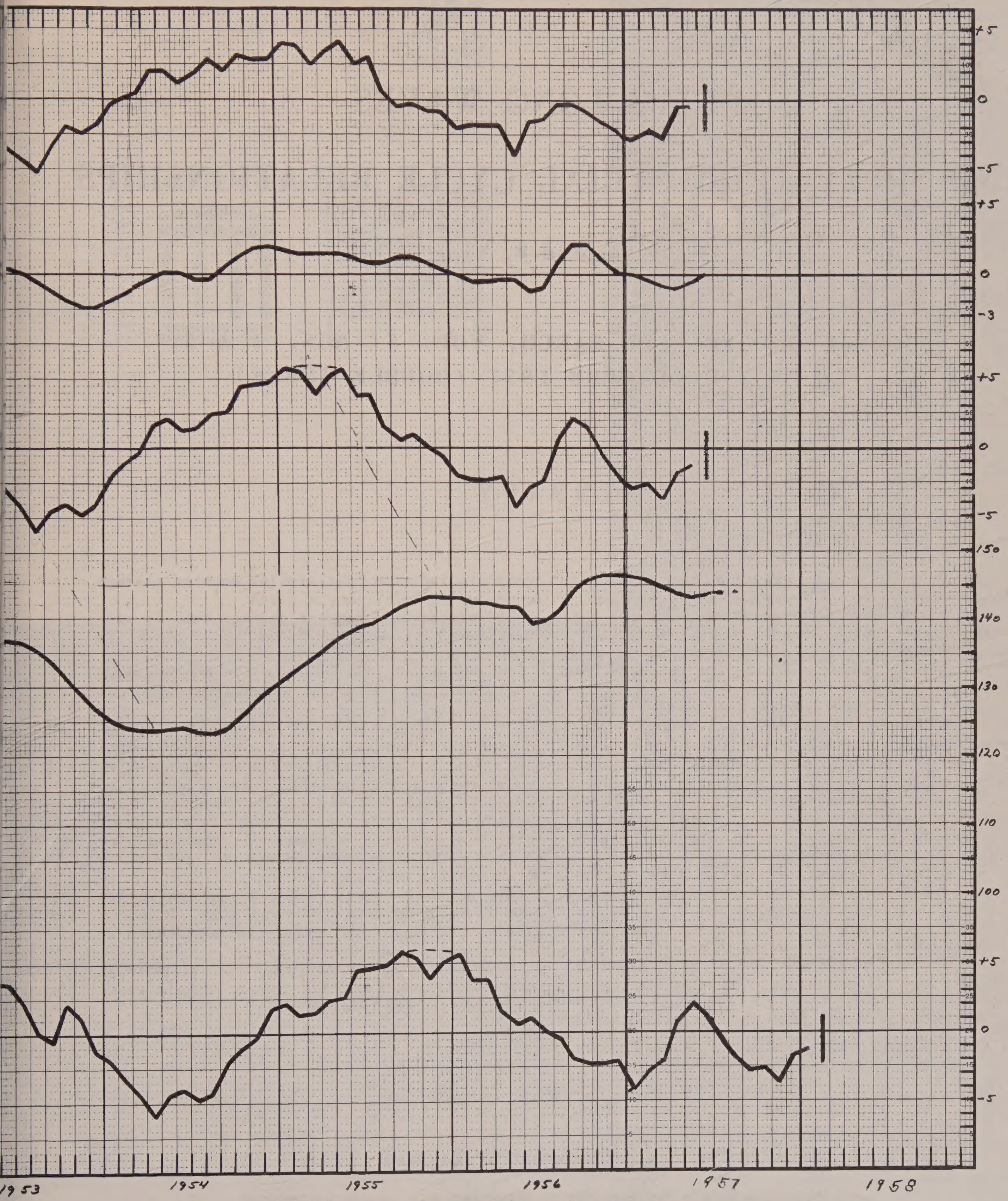
Month	Advanced (8 Months Later)	Geisinger Indicator A	1 st Difference Indicator B	Modified Geisinger Indicator A+B	F.R.B. Index D
Jan. 1957	Sept. 1957	-2.8r	0.00	-2.80	146
Feb. 1957	Oct. 1957	-2.2r	-0.33	-2.53	146
Mar. 1957	Nov. 1957	-2.8r	-0.83	-3.63	145
Apr. 1957	Dec. 1957	-0.8	-1.00	-1.80	143
May 1957	Jan. 1958	-0.6	-0.66	-1.26	143
June 1957	Feb. 1958	(-1.2 to -2.2)	0.00	(-1.2 to -2.2)	144
July 1957	Mar. 1958	*	+0.33	*	144
Aug. 1957	Apr. 1958	*	*	*	144p

p - preliminary   * - not yet available

THE MODIFIED GEISINGER INDICATOR



OF INDUSTRIAL PRODUCTION



Turn to page 273 for the forecast.

Mr. H. A. Musham
741 No. Rush St.
Chicago, Ill.

Now available

ULTRA-LONG WA

AND SOLAR-TERRESTRIAL CYCLE RELATIONSHIPS

by Leonard W. Wing

JOURNAL OF CYCLE RESEARCH, VOL. 6. NOS. 4 & 5,
JULY AND OCTOBER 1957 (DOUBLE ISSUE)

SUMMARY

The principles and general nature of ultra-long wave behavior are summarized and discussed.

Cycle amplitude in temperature increases but little between the Equator and about 20^{0}; it accelerates with latitude beyond about 20^{0}.

Latitudinal passage of the epochs occurs in all waves tested.

Wave lengths of 668-years, 198-years, 11.08-years, 9.93-years, 9.60-years, 9.27-years, 4.418-years, 4.222-years, 3.862-years, 3.767-years, and 5.115-days have been tested for solar-terrestrial relationships.

The tests demonstrate that the wing-shaped pattern of latitudinal passage previously known for the sunspots occurs also in the solar prominences and in terrestrial phenomena.

The poleward passage of high-latitude prominences (counter passage) is reciprocal to the equatorward passage of the sunspots.

The dominant wave in the sunspots is measured as of 11.08-years wave length with an amplitude of 292.4% of trend at the high and 34.2% of trend at the low. Its timing is calculated as at 1948.68 of the calendar.

Two tests of data from the F_2 layer of the ionsphere indicate that similar counter passage occurs at high altitudes on Earth.

The passage and counter passage rate is calculated as $\sqrt{\tfrac{1}{2}(\text{wave length})^2}$ for 90^{0} or about 71% of the wave length.

The timing is given for each wave length tested in the various phenomena, as well as amplitude when possible.

It is concluded that if the behavior of the waves tested is a sample, for every terrestrial wave there is a solar correlative and *vice versa*.

The mathematical probability with respect to chance is given for each solar-terrestrial comparison. A few comparisons between the timings of terrestrial events are given. The probabilities of chance vary from about one in twenty to about one in several millions.

The epochs of each wave pass latitudinally from Pole to Equator independently. It seems likely that for every surface passage there is also a high-altitude counter passage.

It is concluded that many solar and terrestrial phenomena are the registers that record the passage of solar-terrestrial waves.

Order this important 68-page paper (price $2.00) from:

FOUNDATION FOR THE STUDY OF CYCLES
680 WEST END AVENUE
NEW YORK 25. N. Y.